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## Children's emergency presentations during the COVID-19 pandemic

The COVID-19 pandemic has resulted in large-scale changes to the National Health Service (NHS) systems in the UK to accommodate a predicted surge in acutely unwell adults presenting to emergency and critical care departments. National media campaigns reinforced this public health policy in asking families to stay at home to avoid spreading the infection. Early international reports indicated that as a result, some parents and carers were bringing their children to hospital later than they would previously have done so, resulting in avoidable morbidity and mortality.<sup>1</sup> Changes were promptly made to NHS 111 (a non-emergency medical helpline) algorithms (Kenny S, NHS England, personal communication) and a simultaneous campaign was run by the Royal College of Paediatrics and Child Health (RCPCH) to highlight red-flag symptoms (high risk) and amber-flag symptoms (intermediate risk) in children that should prompt a medical review. The effect of media messaging on parental choices to access care is unknown.

Here, we describe a rapid, multi-centre surveillance project with three main aims: (1) to identify the number of children with delayed presentations to hospital in large emergency departments; (2) to find out what proportion of these delays was due to hesitance of parents in attending versus the proportion that was due to advice from primary care staff or NHS 111 referrals; and (3) to find out whether these delays might have resulted in harm to children (using admission to hospital as a proxy).

Paediatric Emergency Research United Kingdom and Ireland, a network of more than 60 children's emergency departments, identified member sites that were willing to do the service evaluation. The

departments that took part allocated a site lead to coordinate mechanisms to collect data on all presentations (of children aged <16 years) via a common data entry portal in a predefined 2-week period within the overall period between April 27 and May 15, 2020 (5 weeks after March 23, 2020, the start of the UK lockdown). The data collection tool included details on whether the child had any red-flag or amber-flag features as highlighted in the RCPCH safety net tool (appendix p 1),<sup>2</sup> the final disposition, and the diagnosis. The attending doctor was asked an objective question: "Do the parents report delaying their attendance at ED for any reason?" The answers to select from were: "no", "unsure", "yes—a health care professional/111 advised the parent not to come to ED following the parents seeking help", and "yes—parents reported waiting longer than they normally would or were concerned about coming to ED."

Data collection was approved under the control of patient information notice issued March 20, 2020. The portal for data collection was approved by NHSX (a digital transformation organisation for the NHS) and no identifiable information was recorded other than date of presentation and age of the child. The project was endorsed by the RCPCH as a national service evaluation and appropriate data protection impact assessments took place.

There were 1460 entries via the portal with 1349 usable entries from seven hospitals (loss of data due to missing entries occurred randomly and sporadically). Most patients (1262 [93.5%]) were felt not to have had a delay in their presentation; in 40 (3.0%) patients, parental delay was thought to be relevant; and in 11 (0.8%) patients, advice from a health-care professional or NHS 111 was thought to have resulted in delay. In 36 (2.7%) patients, there was uncertainty as to whether there was potential delay. Of the

51 patients whose attending doctor was concerned that delay had occurred, six (11.8%) were admitted. One of these patients, a child with diabetic ketoacidosis, was admitted to a children's intensive care unit having had amber-flag symptoms reported before presentation. There were no clear trends between the age of the patient and reported delay in presentation (appendix p 2).

Red-flag symptoms were reported in 81 (6.0%) of 1349 patients. Of these, only two (2.5%) were felt to have been delayed in presenting and neither of these patients was admitted to hospital. Only one (0.1%) of the 1349 children presented with concerns relating to safeguarding during the study period. 24 (47.0%) of the 51 children whose presentation was perceived to be delayed had soft tissue injuries or fractures but no other specific pathologies were overrepresented in this cohort.

To the best of our knowledge, this is the first national evaluation of potential delays in presentations to children's emergency departments during the height of the COVID-19 pandemic. Reassuringly, we found a low rate of reported delays and a low rate of hospital admission within this delayed group. Because studies of this type have not previously been done, it is difficult to know whether delayed presentations have increased or decreased as a result of system changes during the pandemic, and interpretation is also challenging because of the multifactorial nature of deterioration and disease outcome in children and young people. Only six (11.8%) of the children with suspected delayed presentation were admitted to hospital during this study, which suggests that the delay did not substantially affect outcomes; however, any morbidity in a child should be minimised.

Age-related admission rates were similar to previously reported data,<sup>3</sup> although the number of infants younger than 6 weeks who presented at emergency departments was lower



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than expected (56 [4.2%] of 1349). No child in this age group was admitted after a suspected delayed presentation, which is notable given the concerns that have been raised about the lack of health visitor input during the pandemic.<sup>4</sup> Although red-flag symptoms, as per RCPCH guidance,<sup>2</sup> made up 6.0% of presentations, very few of these symptoms had been dismissed by parents. It is possible that rapid dissemination of concerns about delayed presentations (by NHS England, the RCPCH, and many charities) in early April, 2020, impacted this finding, but it is difficult to be sure about this temporal relationship.

The generalisability of our data across all emergency department settings is uncertain, but rates of presentation of children to emergency departments have been reported to have fallen by 73–88% since the start of the pandemic,<sup>1</sup> and our data are representative of typical lockdown attendances.<sup>5</sup> A future data collection exercise should take place during a period of less restriction to identify any changes in behaviour. It would also be useful to describe, qualitatively, the cohort of children with delays in presentation to identify any socioeconomic or system factors that might be related to these delays.

Although the lockdown message in the UK was to stay at home, delayed presentations were rare, but there were some that seemed to be related to the COVID-19 pandemic. If lockdown persists or has to be reinstated, then public health messages should reinforce the message that emergency services are open and accessible to children and young people.

We declare no competing interests. The initial evaluation design was by DR, RH, NB, DH, SP, and IS contributed to development. Study data were collected, processed, and evaluated by DR and RH. All authors contributed to both initial and final drafts and agreed to the submission of the final draft. This project received no funding.

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